Software Tech News

In This Issue :

DACS Named the DoD Software Information Clearinghouse

by Thomas McGibbon, DACS Director

In September 1996, the Software Management Review Council (SMRC) designated the Data & Analysis Center for Software (DACS) as the DoD Software Information Clearinghouse. In so doing, the SMRC has identified the DACS as the focal point for DoD and other personnel to locate information about all aspects of software technology; state of the art and best practices, education and training, and DoD - plans, policy, and standards.

The DACS will disseminate this information primarily through its newsletter, Software Tech News, and via the DACS Web Page at **http://www.dacs.dtic.mil**.

DoD personnel can also gain information or assistance by contacting the DACS via telephone at (315) 334-4905 or via E-mail at **dacs@dtic.mil**.

The requirement for a clearinghouse evolved from a recognized need that DoD users need rapid and timely access to such information as software technology, including metrics, education and training, calendar of events, best practices, and software policy and standards. To achieve the rapid access requirement, a web site has been developed by the DACS to assist DoD Program Managers, PEO's and personnel at T&E Centers, R&D Laboratories, Maintenance Centers, and Central Design Facilities in locating software information and resources.

**Your Source for Information in
Software Engineering Technology.**

DACS

Data & Analysis Center for Software

http://www.dacs.dtic.mil

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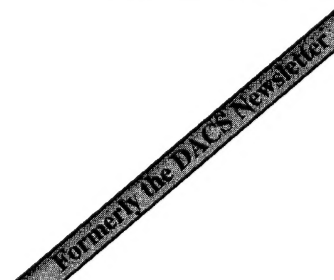
The Cohen Amendment Impacts Government IT Acquisitions
Information Technology Management Reform Act - 1996

New rules concerning Government acquisitions of Information Technology (IT) took effect on 8 August 1996. The new legislation is the Information Technology Management Reform Act (ITMRA), which is also known as the Cohen Act, or Cohen Amendment, after its sponsor, former Maine Senator and now Secretary of Defense, William Cohen. The amendment is included as Division E of the National Defense Authorization Act for Fiscal Year 1996. Despite being part of a defense authorization bill, the amendment applies to all federal executive agencies, both military and civil.

Provisions of the Amendment

The first provision of the amendment repeals the Brooks Act, which governed acquisition of Information Technology by federal executive agencies since 1965.

Other major provisions of the Cohen Act specify:
- Decentralized procurement authority
- Agency Chief Information Officers
- Commercial management practices
- Modular contracting
- Pilot programs
- Bid protest reform

Secretary of Defense, William Cohen

Decentralization.
Procurement authority has been moved from the General Services Agency (GSA) to individual agencies, with oversight responsibility transferred to the Office of Management of the Budget (OMB). Agencies are to pursue their own Information Technology purchases, rather than submitting requests to GSA or obtaining a Delegation of Procurement Authority (DPA) from GSA for particular acquisitions. Under the Brooks Act, GSA coordinated all purchase, lease and maintenance contracts for IT. Now, the overall control is with the OMB. The OMB Director's role can be compared to that of a corporation's Chief Financial Officer who is responsible for capital planning and investment control.

CIOs.
The ITMRA requires that each agency appoint a Chief Information Officer (CIO), to bear responsibility for that agency's IT procurements. This is another concept borrowed from the private sector. The functions of an agency CIO are to monitor the agency's performance on IT programs, to advise the agency head on ongoing programs, and to assess the capabilities of the agency's IT personnel. The CIOs report financial and performance data to the OMB Director, and are responsible for ensuring its accuracy.

Management practices.
Among the management practices specified in the ITMRA are cost-benefit analyses, return on investment, risk assessments and minimization, performance-based and results-based management. Successful tools and processes from the private sector are referenced in the amendment. Agencies are required to benchmark their performance against comparable commercial processes.

Modular contracting.
This provision of the ITMRA calls for large IT purchases to be made in successive acquisitions of interoperable increments.

The Cohen Amendment -

Specific time guidelines for this are in the amended Federal Acquisitions Regulations (FAR). For example, contracts must be awarded within 180 days of the solicitation date and deliveries must be completed within 18 months. These time constraints will necessarily limit the size and complexity of the procurement increments.

Pilots.
The bill defines two pilot procurement programs to be conducted by the Office of Federal Procurement Policy. The first is a limited program called "share-in-savings," whereby the successful vendor gets to keep a portion of the money the Government saves by implementing the vendor's solution. The second type of pilot program will be more common. It is described as "solutions-based contracting" and includes 12 specific contract process requirements, such as the use of simple solicitations and proposals, oral presentations by offerors, and a trial performance period before the final contract award.

Bid Protest.
One provision of the bill (Section 5501) changes the way bids can be protested, by abolishing the GSA Board of

Contract Appeals (GSBCA). Protesters now must go to the General Accounting Office (GAO), the US Court of Federal Appeals, or a US District Court. This change is intended to alleviate a perceived clogging of the system by unsuccessful offerors who file protests "as a matter of course," and therefore slow down the contract award process.

Exceptions

Just as with the Brooks Act, exception to the regulations is made for DoD procurements related to National Security Systems (NSS). These are known as "Nunn-Warner Exempted Federal Information Processing (FIP) Resource Acquisitions". Their exemption does not mean that those procurements are free from oversight, but rather that the control over those programs will be accomplished differently, due to the sensitivity (i.e., classified or controlled access) of the information contained in NSS solicitations, proposals and contracts. New policy regarding acquisition oversight of these systems in light of the ITMRA is being developed by DoD; an interim version took effect also on 8 August 1996.

Intent of the Reforms

The genesis of this act is within the Reinventing Government Initiatives. The intent is to move away from a process orientation and toward performance based management. The technology environment that the Brooks Act provisions addressed has evolved so far, from mainframes and custom software to assembling systems from commercial off-the-shelf components, that many of the safeguards and issues built into the process are no longer necessary or relevant.

Specific improvements expected from the ITMRA include:
- Achieving more visibility and accountability in the process (CIO reporting requirements)
- Increasing flexibility (modular contracting)
- Decreasing the time needed to complete acquisitions (e.g., changing award protest procedures)
- Opening up the Government IT market to smaller and/or newer companies
- Adopting, and adapting where necessary, successful practices from the private sector (e.g., BPR, risk management, performance measurement).

Evolutionary Design of Complex Software (EDCS) Addresses Software Modernization Needs

by Douglas A. White - Rome Laboratory

Introduction

The Evolutionary Design of Complex Software (EDCS) program is a jointly sponsored technology endeavor of Rome Laboratory and Defense Advanced Research Agency (DARPA), addressing the need for continuous modernization of military systems over extended lifetimes. The EDCS program is a new program that began in late 1995 with a Broad Area Announcement (BAA) resulting about fifty contract and grant awards, the first beginning in May 1996 and most awarded by the start of 1997. With software becoming a critical part and governing the behavior of most civilian and military systems, the best way to adapt existing systems to changing requirements is through changing the software. EDCS investigates ways to create software that is more easily evolved and to transform current legacy systems into evolutionary systems.

The DoD faces problems not found in most commercial software systems. DoD systems have an extremely long life span. Over the long period of time between initial introduction and final retirement, systems face many changes caused not only by improvements in technology, but also changing roles and environments. Today's systems change, but only at great cost and risk. As today's systems age they become brittle and fragile as the complexity becomes greater and the ability to understand the system decreases. Changes in behavior and the cost to accomplish these changes are unpredictable.

The approach taken in the EDCS program is to enable systems to affordably adapt to changing requirements and operating environments through:

- Creating an information or knowledge base for evolution by capturing, managing, and easing access to and understanding of both informal and formal design rationale information;

- Providing analysis of the impact of intended change on behavior, performance and other system attributes such as reliability and safety; and

- Enabling the design of more evolvable systems through the use of formal representations of architecture and behavior in the generation of code.

The current phase of the EDCS program consists of technology investigation and capability packaging efforts geared to developing and demonstrating the technology needed to create evolvable systems. A future phase of the program will demonstrate the integration and application of this technology to actual DoD systems.

Program Organization

The EDCS participants include Rome Laboratory, DARPA, the Software Engineering Institute (SEI) and contractors. This team is organized into five technology clusters, each addressing a different aspect of evolvable software. Collaboration in the EDCS program was natural for Rome Laboratory because of its previous research and development experience in both conventional and knowledge-based software engineering. Rome Laboratory and DARPA share the management of the approximately fifty different projects with Rome Laboratory serving as the contracting agent on most. Rome Laboratory and the SEI share the role of coordinating each of the five clusters of contractor with the goal of minimizing redundancy and duplication of effort within and between clusters and maximizing the interoperability of cluster products.

EDCS

EDCS is a Joint DARPA/ Rome Laboratory Initiative

Technology Clusters

The five EDCS cluster group titles are:

1. Rationale Capture and Software Understanding
2. Information Management
3. Architecture and Generation
4. High Assurance and Real-Time; and
5. Dynamic Languages.

Each cluster is responsible for defining and coordinating scenarios which will serve as the basis for demonstration of the technology of the cluster. Each cluster also includes an "integrator" contractor responsible for creating integrated demonstrations of the many individual cluster technologies.

1. Rationale Capture and Software Understanding

This cluster addresses the need for understanding of software in both development and evolution by developing capabilities to capture design decisions and rationale. This knowledge would then be used to support software understanding by providing explanation of the "what, why and how" throughout the life cycle. Research topics in this cluster include design knowledge representation, collaborative design, analysis of change, multimedia explanation, reverse engineering, and run-time monitoring.

2. Information Management

This cluster addresses the issues of representation, communication and manipulation of design artifacts and processes. Topics being pursued include use of the World Wide Web technology, versioning and configuration management, information models, evolution information and presentation.

3. Architecture and Generation

Architecture and generation deal with the issue of representing the architecture such that it can be used to support the composition and adaptation of systems from interoperable components. Topics of research include architecture representation and languages, domain modeling and analysis, and composition and generation techniques.

4. High Assurance and Real-Time

This cluster deals with testing and the ability to predict the impact of change on the evolving system. Topics being investigated include test environments, continuous testing, automatic retest, and dynamic upgrades.

5. Dynamic Languages

The goal of the dynamic language cluster is to produce advanced development capabilities providing the capability to both rapidly prototype and produce efficient and correct implementations. This topic involves the languages Dylan, Haskell, ML, Ada95, Java and CLOS and addresses the topics of hyperprogram structure, analysis tools, and program correctness.

Additional Information

This is just the beginning of the EDCS program as plans are currently in progress to transition this technology into actual use in DoD systems. Future efforts will include integration and demonstration of the ability to evolve operational software affordably and predictably.

For additional information visit the Rome Laboratory's EDCS Home Page at **http://www.se.rl.af.mil:8001/ edcs**. ▲

A Must Read!

Edward Yourdon's Rise & Resurrection of the American Programmer

reviewed by Marshall Potter - Naval Information Systems Management Center

Every once in awhile a gem appears and you are able to afford to buy it, admire it and enjoy it. Ed Yourdon's newest book, Rise & Resurrection of the American Programmer , is one of those gems, in reality a polished diamond. This book builds on his previously outstanding book, the Decline and Fall of the American Programmer, (Prentice-Hall, 1993). In that book, Yourdon espoused a rather "gloomy" and pessimistic assessment of the competitive posture of the American software industry in the global marketplace. In that book, he also proposed several key technologies that were vital to us if we were to succeed, "Silver Bullets" that can have an aggregate impact on software productivity and quality. Some of those concepts that he felt were key included Peopleware, the SEI's CMM, Software Methodologies, CASE, Metrics, Software QA, Software Reusability, and Software Re-engineeing. But as he states in his preface, things change and in the past four years things have changed considerably.

The first chapter of the "Rise & Resurrection" is focused on that change and how the premises and ideas of the "Decline & Fall" have either fallen or changed significantly to allow us to have a much more optimistic perspective for our future. Some of the key premises are "rapidly disappearing" such as the ten-fold salary differentials between other countries and ours. The productivity and quality of the software products in developing countries and the Pacific Rim are not uniform and the productivity differences between high-productivity shops and low-productivity shops has increased from a ratio of 4:1 to 600:1 during the past decade. He addresses what customers want and also what potentially are the
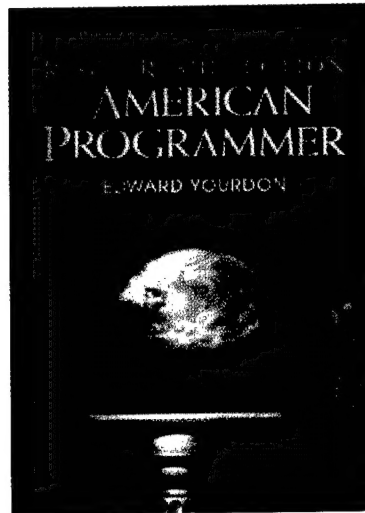
Prentice-Hall, 1996 - $26.95

least important factors to them. This sets the foundation for what is to come.

In his "Decline & Fall", Yourdon summarized the critically important concept of "Peopleware". Peopleware continues to be his most important "Silver Bullet". Again, times have changed and some of the critical issues in Peopleware have evolved also. In DeMarco's and Lister's wonderful little book on Peopleware, (Dorset House, 1987) they discuss issues such as the furniture police and teamacide. These continue to be important, but today with downsizing, rightsizing, disestablishing, etc., other issues have cropped up that have taken precedence such as the "breaking of our social contracts" with our employees, "360" reviews and the "audition process" for selecting new staff. From my perspective, Yourdon is right on the mark, "Good people develop good software." and if we want to keep our good people we have to address the "Peopleware" issues.

Chapter 3 discusses the other Silver Bullets of his "Decline & Fall". This is not a rehash, but a true reassessment of what is important today. Again the SEI's CMM continues to be important in his eyes, but with a critical concern that process is not everything. He addresses what he feels is an exaggerated concern with getting to CMM levels and the real possibility of stifling creativity and innovation. Another real change has occurred with respect to the use of object technology. In 1993, there was only a small use and knowledge of "objects". He estimated that only 3-4% of the developers in the world were using it in 1993. However, by the mid-1995, he estimates that the market share had risen to 15-20 % level, making it important for all of us to understand this technology

A Must Read!

better. It was also interesting to see his analysis on metrics. To quote him:

> "I recommended metrics as a silver bullet in Decline and Fall of the American Programmer, and I still do. But it's obvious that most IT organizations haven't done much about the concept.
>
> Its a shame and a waste that he is right on the mark. Metrics are a key to improvement. As Watts Humphrey's often notes, "If you don't know where you are, a map won't help".

In the next section of the book he discusses four new ideas, System Dynamics, Personal Software Processes, Best Practices and Good-Enough Software. In chapter 4 he discusses the ideas of system dynamics and the work of Tarek Abdel-Hamid of the Naval Postgraduate School. Yourdon points out that the CMM can help you get from Level 1 to Level 3, but to go from Level 3 onward you really should address system dynamic models and you need to address these as on-going investments. As in his "Decline & Fall", in this book Yourden introduces you to new ideas and he will provide you with plenty of references of where to get additional information. You will probably find as I did, that his reference sections and his Appendix "Updated Programmers Bookshelf" will be the most used items in the book after you have read it and tasted its delicacies.

I was personally excited to see his discussion on Watts Humphrey's Personal Software Process or PSP, Chapter 5. This chapter is really a summary of Humphrey's newest text. To quote Yourdon,

> "This is definitely a book that you need to understand, and whose advice and guidance you need to follow."

There is no question to the many who have listened to Watts expound on this process at the SEI, that he is right. The PSP is probably going to have the biggest impact on how we perform in the future, more so than even the original CMM. The reason can be found in the fact that "good people build good software". Chapter 6 focuses on Best Practices. This chapter is really a fascinating exposition on the DoD Software Best Practices Initiative that comes under the Software Program Managers Network under the able leadership of Norm Brown. Yourdon follows in the footsteps of the great bible commentators and provides a homiletic approach to bringing the best practices to life. I found this section to fully explain and expound on how the best practices were selected and how they will impact our lives. Critically important is the concept that best practices are not ideas and hypotheses, but the processes that we are currently using that work best. In our field, we are too quick to pick up on a new idea and to declare it to

be a best practice, far too fast and before we have any hard results. Yourdon also states that what constitutes the "best practices" in your organization depends not only on the technology, but also on the culture, leadership style and politics. Interestingly, Yourdon ends the chapter with an analysis of the "worst practices". These may not be the worst, but they are certainly worth avoiding. Chapter 7 discusses what some may say is almost apostasy for a software engineer, "Good Enough Software". Good enough software allows us to make trade-offs between schedule, functionality (or "feature richness") and quality. Yourdon notes this is never easy, but it really has to be done. Like his other chapters, he provides plenty of good references of where to go next if you need to know more.

The final section of this gem is called "The Brave New World". In this section, Yourdon discusses Service Systems, the Internet, Java and the new Internet programming paradigm, the Microsoft paradigm and embedded systems. In the earlier part of the book, Yourdon discussed the key concepts that are of value to the people who build and maintain today's systems. In this section, he discusses his view of the future.

A true gem, polished, and a very worthy successor to his "Decline and Fall". Read it, study it, do it! I think you will really enjoy it. I did! ▲

Return On Investment from Software Process Improvement

by Thomas McGibbon, DACS Director

A recently published report from the DACS, titled "A Business Case for Software Process Improvement," researched, generalized, and modeled in a spreadsheet the cost benefits one can achieve from Software Process Improvement (SPI). The model was developed from information obtained in a detailed review of the open literature.

The report analyzes benefits from four approaches to software process improvement:

1) Implementing a complete SPI program such as that of the Capability Maturity Model (CMM) from the Software Engineering Institute (SEI);

2) Formal inspection programs;

3) Software reuse; and

4) A cleanroom software engineering approach.

Process improvement programs are shown in the report to reduce development costs and rework costs, as well as to improve productivity, cycle time and quality. These improvements, once implemented by an organization, are shown to have a significant positive Return-On-Investment (ROI) to the improved organization. The report and accompanying spreadsheet model the costs of
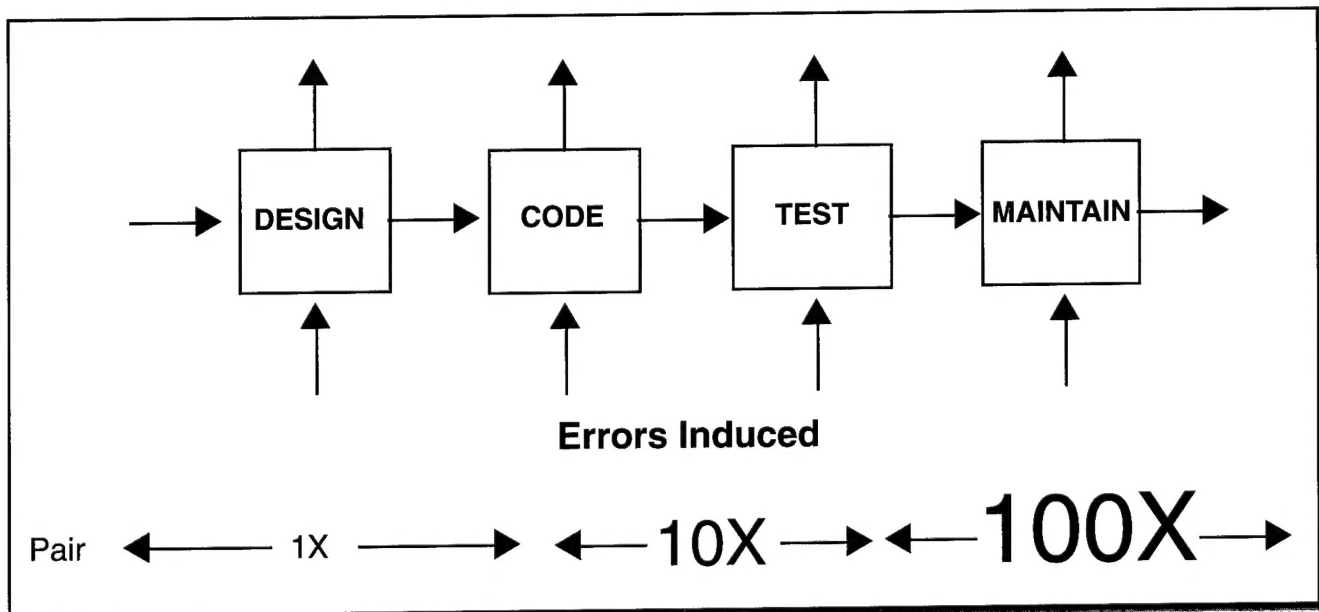
Figure 1. Modeling Rework Costs from Defects

ROI from SPI

the improvement, the reduction in costs to develop software and the reduction in maintenance costs.

Maintenance costs examine the impact on rework costs from defect removal with process improvement programs. A major issue addressed in SPI programs is the detection and removal of software defects at or near the point of insertion of the defect. As can be seen in Figure 1, as you move from design/ implementation stages to test stages, the cost to repair a defect induced during design has repeatedly been shown to be a 10 times (10X) cost increase. If that design defect has not been found until the product is released to the customer, the repair costs increase by 100X compared to finding and removing the defect during design. Each process improvement strategy has

documented the efficiency with which it is able to remove defects sooner. This effect is modeled in the spreadsheet and report.

Each process improvement strategy has many examples in the literature which document both the increased productivity from the strategy as well as the costs associated with implementing the strategy. Improved productivity results in reduced development costs. Within the report and spreadsheet, a COCOMO cost estimation model is employed to estimate what the cost of a particular sized development effort would be when the increased productivity associated with that improvement is factored in. Each improvement strategy also has a cost, which is typically a function of the project team size and amount of code to be developed. Those

costs are also modeled in the report and spreadsheet.

The report concludes by comparing the ROI from each of the process improvement strategies for a particular sized project, as well as comparing results for each strategy for various sizes of project. The report also includes a thorough 10 page annotated bibliography on the ROI from SPI topic.

This report can be viewed in its entirety through the DACS web page (see box below) under the Software Process Improvement Topic Area.

A free hardcopy of the report can be ordered by contacting the author via E-mail (**tmcgibbo@rome.kaman.com**).

The spreadsheet that accompanies the report can also be ordered for a nominal fee from the author. ▲

**This Report is Available in its Entirety Through
The DACS Web Site On-line At:
http://www.dacs.dtic.mil**

The Cohen Amendment -
Continued from page 3

Expectations spelled out in the amendment are that these reforms will annually result in both a 5% decrease in IT costs and a 5% increase in efficiency. Agency accountability is to be achieved by giving the procurement oversight function to the same organization that sets their budgets. Thus, the OMB will review the performance results reported by each agency's CIO, and incorporate that assessment in its IT budget - setting process for the agencies.

The intent of designating a CIO is to invest a cognizant person with both the visibility and authority required to manage IT acquisitions within the mission goals of each agency. Many see the success or failure of the ITMRA as dependent on the quality of the people selected for the CIO positions (and whether or not their agencies actually give them the time, power, etc. they need to be effective).

Federal CIOs are required to develop business cases to support their IT investment requests. The CIOs need to have measurable results, too. The business case is evaluated in getting funding. The results, including adherence to

schedules, are evaluated in decisions to keep the funding. The CIO's job includes advising their agency heads as to whether programs should be continued, modified, or terminated. That advice is to be based on business management principles, which require performance data.

The ITMRA should reduce the time required to purchase new systems. Before, the procurement process could take two years from when a project was proposed until an agency actually bought the equipment. In an environment where the technology development cycle is shrinking, long procurement lead times were seen as keeping the Government behind the curve, even to the point of finding their IT purchases to be obsolete by the time they were completed. Although the goals of the process embodied in the Brooks Act — to ensure fairness, discourage corruption and prevent the selection of vendors based on political favor — are still valid, the process was too slow to be effective in technology acquisition. The Cohen Act is intended to find a compromise between speeding up acquisitions and giving up on impartiality.

Reactions and Responses

A Federal CIO Council, created by Executive Order, has been formed to provide interagency guidance. The council is composed of CIOs from each agency, headed by the CIO from GSA. The council provides a forum for refining the duties of the CIO position and for sharing best practices and information among agencies.

The GSA is preparing changes to the Federal Acquisition Regulations (FAR) to reflect the ITMRA. Other service and agency-specific regulations and instructions are being developed or modified to give guidance, and define procedures for compliance with the ITMRA within their own mission statements.

Agencies have created the required CIO positions, and many have developed WWW sites specifically for their CIO function and its support organizations. The Navy, for example, is assigning a CIO for each military department in each echelon, down to the base level. The Navy CIOs will interact to form a virtual organization within the existing Department of Navy structure.

The Cohen Amendment -
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Relationship to other IT/ Acquisition Initiatives

The ITMRA is one of several acquisition reform initiatives currently underway. Others include:

*   Federal Acquisition Reform Act of 1996 (FARA). This is Division D of the same FY96 Defense Authorization Act

*   Federal Acquisition Streamlining Act of 1994 (FASA), which is reflected in the newly updated documents DoDD 5000.1 and DoDD 5000.2-R

*   Paperwork Reduction Act of 1995 (PRA)

*   10 USC 8014 - U.S. Code

*   Government Performance and Results Act of 1993 (GPRA).

Further Information

The text of the Cohen Amendment can be found at several locations on the World Wide Web; including; **http://www.dtic.mil/dodim/ cohen.html**.
The size of this is file 77K.

DoD Related Web Sties

The Fedmarket site's Legislation page has links to the text of both the ITMRA and the FARA, as well as to some of the related regulations. It is located at **http://www.fedmarket.com/ legislation.html**.

The DACS WWW site **http://www.dtic.dacs.mil** has an ITMRA subtopic in the Plans, Policies and Standards Topic Area, which contains links to the sites listed here and to a bibliography of ITMRA-related articles.

The Office of IT Policy at GSA has an extensive WWW site at **http://www.itpolicy.gsa.gov/** that covers acquisition issues and information from their perspective.

Military Service CIO pages include:

*   The Department of Navy (DON) CIO page is hosted by the Naval Information Systems Management Center (NISMC) at **http://www.nismc.navy.mil/ don-cio/nismc.htm**

*   The Air Force CIO site is at **http://www.cio.hq.af.mil**

*   The Army acquisition reform site is at **http:// acqnet.sarda.army.mil/ acqref/default.html**.

The ITMRA will be the topic of the closing general session at this year's Software Technology Conference (STC'97), to be held on 1, May in Salt Lake City, Utah. ▲

DACS- The DoD Software Information Clearinghouse

Continued from page 1

As you can see, this newsletter has changed in both style and format. The new title of the newsletter was chosen to specifically identify the DACS' new focus - Software Technology. The newsletter content has been expanded to include articles and information both suitable and useful to Program Managers and Program Executive Officers who utilize, develop or acquire software, as well as continuing to provide this information to researchers as we have in the past. Our objectives for the new DACS newsletter are to provide: information about current policies, plans and standards that affect you now, information about important new technical findings; information about new articles, reports and books, information about upcoming courses and events, and WWW URLs that point to important new happenings in software technology. Every newsletter will be accessible from our web site.

A Newsletter Editorial Board oversees each issue of the newsletter in terms of content and quality. The members of the editorial board are, in addition to DACS staff members: Mr. Paul Engelhart of USAF Rome Laboratory, Mr. Morton Hirschberg of US Army

Research Laboratory, Mr. Jack McGarry of the US Naval Undersea Warfare Center, and Mr. Marshall Potter of the US Naval Information Systems Management Center.

If you have not visited the DACS web site in the last 3-6 months, you will see significant changes which occurred there as well. The goal of our web site, as is the newsletter, is to provide current, up-to-date, noncommercial, information about software technology as well as pointers to useful web resources.

Some of the most useful features of the DACS web site are Navigation Icons and The Topic Areas.

1. Navigation Icons on the left side of most pages. Those icons of speci
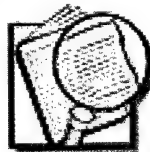
Search

The SEARCH Icon allows you to perform a keyword search across multiple, user selected, sites. You no longer have to visit each site to locate information. Many of the more commonly accessed sites are listed and can automatically be included for search. This capability will be available to the public in early June.
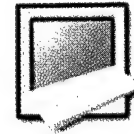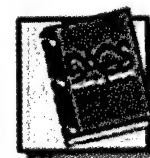

**Education
and Training**

The EDUCATION and TRAINING Icon provides pointers to education and training resources available within the DoD, as well as to some sources outside of the DoD.

**Calendar
of Events**

The CALENDAR of EVENTS Icon provides a valuable list of upcoming conferences and events to the DoD software community.

**Technical
Reports**

The TECHNICAL REPORTS Icon points to the most popular area on our site. On-line browsing and down loading of technical reports.

DoD Software Information Clearinghouse
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2. The Topic Areas shown in the center of the DACS Home Page provides access to on-line resources in technical areas being tracked by the DACS, as well as information about current activities in the DoD plans, policies and standards. Technical areas being tracked include;

Cleanroom Software Engineering, Formal Methods, Software Measurement, the Year 2000 (Y2K) problem, Ada and Java, Software Reuse, Security, Software Process Improvement, and Software Technology Base.

We hope that you will visit our web site many times, bookmark it and make it your starting point to explore software technology information. Our site currently has in excess of 1,000 pointers to internal and external material, but as stated throughout our web pages, if you have suggestions for other resources to be added to our web site, please send us a message at **dacs@dtic.mil**. ▲

DACS Course Announcement !!
"Software Measurement: Implementation and Practice"
5-7 May 1997 - Kaman Sciences Corporation, Alexandria, VA

Course Outline:

History of Software Measurement

Using Measurement in Software Engineering Practice

Data and Metric Collection Methods

Metrics (McCabe's Cyclomatic Complexity) & Management Indicators

Measurement Paradigms

Data Repositories

The Experience Factory

Measurement Experiments

Instructor:

Dr. Basili is a Professor in the Institute for Advanced Computer Studies and the Computer Science Department at the University of Maryland, College Park, Maryland. He is a world recognized expert in software measurement, having lectured and consulted on this topic in the US, Japan, and Europe. He also measures and evaluates software development in industrial and government settings, consulting with many agencies and companies including: IBM, GE, CSC, GTE, MCC, AT&T, Motorola, BP, Boeing, NRL, NSWC, and NASA.

Registration Information:

Cost: $595

Schedule: 2 1/2 days of instruction
Kaman Sciences Corporation
Alexandria, VA

Contact Information: DACS Customer Liaison
Data & Analysis Center for Software
P.O. Box 1400
Rome, NY 13442-1400

Telephone: (315) 334-4905
Fax: (315) 334-4965
E-mail: **cust-liasn@rome.kaman.com**

DACS Course Announcement !!
"Cleanroom Management and Technology"
6 May 1997 - National Technology University (NTU)

Course Objectives are to Understand:

✦ Cleanroom software engineering as a practical process for developing high reliability software with high productivity.

✦ The process of Cleanroom management through the incremental development life cycle.

✦ The technologies of Cleanroom specification, design, correctness verification, statistical testing, and reliability certification.

✦ The integration of Cleanroom with the SEI Capability Maturity Model for Software.

Course Outline:

Cleanroom overview and results
Cleanroom technologies
Function-theoretic correctness verification
Statistical testing and software certification
Cleanroom and the Capability Maturity Model

Cleanroom management through incremental development
Function specification and design with box structures
Usage specification and modeling
The 15 Cleanroom Processes
Return on Investment from Cleanroom Engineering

Themes:

✦ Risks can be managed or avoided through incremental development and disciplined engineering processes.

✦ Software fitness for use can be scientifically certified.

✦ It is possible to routinely develop software that approaches zero failures in use.

Instructor: Richard C. Linger is a Visiting Scientist at the Software Engineering Institute from Lockheed-Martin Federal Systems Division. He is responsible for defining the integration of Cleanroom software engineering with the Capability Maturity Model for Software, and assisting the Air Force in implementing Cleanroom technology. Mr. Linger was a co-developer of the Cleanroom process at IBM, and founded and managed the IBM Cleanroom Software Technology Center. He has published two software engineering textbooks and numerous book chapters and technical papers.

Co-instructor: Thomas McGibbon will present an overview of the Return on Investment from Cleanroom Engineering. McGibbon is the Director of the Data & Analysis Center for Software and the author of "A Business Case for Software Process Improvement: A State of the Art Report".

Intended Audience: Software project managers, software development and maintenance managers, SEPG members, software engineers in both new development and evolution of legacy systems, and software quality control and acquisition personnel.

Registration Information:

Cost: **$200**

Schedule: One live, 6 hour broadcast:
6 May 1997
11am - 5pm Eastern Time

Contact Information: DACS Customer Liaison
Data & Analysis Center for Software
P.O. Box 1400
Rome, NY 13442-1400

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Software Technology Calendar of Events

April 1997

22-23 [Conference]
DTIC Southern Regional Users Meeting and Training Conf.
Austin, TX USA
POC: Ms. Julia Foscue; (703) 767-8222/8236 or
DSN 427-8222/8236; Fax: (703) 767-8228 or
Fax-DSN 427-8228; **jfoscue@dtic.mil**

April 27-2 May [Conference]
The 10th Annual Software Technology Conf. (STC '97)
Co-hosted by: Software Technology Support Center (STSC),
Utah State University Extension and
Ogden Air Logistics Center/CC
Salt Palace Convention Center
Salt Lake City, UT USA
POC: Dana Dovenbarger, Conference Manager;
(801) 777-7411 DSN 777-7411,
Fax: (801) 775-4932; Fax-DSN 775-4932
dovenbar@oodis01.hill.af.mil

May 1997

5-7 [Course]
"Software Measurement: Implementation and Practice"
Sponsored by: Data & Analysis Center for Software
Kaman Sciences Corporation
2560 Huntington Avenue
Alexandria, VA USA
POC: Anne Robinson, DACS Customer Liaison;
(315) 734-3696; Fax: (315) 734-3699;
cust-liasn@rome.kaman.com

5-9 [Conference]
6th Software Testing Analysis & Review Conf. (STAR '97)
Sponsored by: Software Quality Engineering
Fairmont Hotel
San Jose, CA USA
POC: SQE Information; (800) 423-8378,
Fax: (904) 268-0733; **sqeinfo@sqe.com**

May 1997 (continued)

5-7 [Course]
"Cleanroom Management and Technology"
Sponsored by: Data & Analysis Center for Software
and National Technology University (NTU)
One 6 hour live broadcast
POC: Anne Robinson, DACS Customer Liaison;
(315) 734-3696; Fax: (315) 734-3699;
cust-liasn@rome.kaman.com

6-7 [Conference]
DTIC Northeastern Regional Users Meeting and Training Conf.
Ft. Dix, NJ USA
POC: Ms. Julia Foscue; (703) 767-8222/8236 or
DSN 427-8222/8236; FAX: (703) 767-8228 or
Fax-DSN 427-8228; **jfoscue@dtic.mil**

13-15 [Conference]
1997 Dual-Use Technologies & Applications Conf.
Sponsored by: Mohawk Valley Section - IEEE,
Association for Computing Machinery (ACM), and
Computer Applications Software Engineering Center (CASE)
ITT Sheraton Four Points Hotel
Syracuse, NY USA
POC: Andrew L. Drozd, General Chair;
(315) 337-4396; androl@aol.com
POC: David Williamson, Technical Chair;
(315) 330-7324; Fax: (315) 330-3709;
williamson@rl.af.mil

17-24 [Conference]
The International Conference on Software Engineering 1997
Sponsored by: ACM SIGSOFT and
IEEE Computer Society
Sheraton Boston Hotel and Towers
Boston, MA USA
POC: ICSE 97 Coordinator; (413) 545-2475
POC: W. Richard Adrion, General Chair;
adrion@cs.umass.edu ▲

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